

Chapter:	Preliminary investigations
Date:	April 2012
Size:	6 pages
Description:	This fact sheet provides a questionnaire for collecting the base data for assessing the feasibility of a solar district heating system at a specific site.
Author:	Thomas Schmidt, Solites – schmidt@solites.de
Co-author(s):	-
Available languages:	English
Version id:	2.4-2
Download possible at:	www.solar-district-heating.eu

Contents

Introduction	2
General description of supply area and consumers	2
General description.....	2
Site map.....	2
Climatic data	3
Chronological development of the heat load	3
Electrical and thermal energy demand, distribution systems and temperature levels	4
Technical equipment.....	5
Geological data.....	5
Stratigraphic sequence	6
Economical data	6
Legal situation.....	6
Development scheme	6
Other legal boundary conditions / restrictions	6
ESCOs	6

Introduction

In order to be able to make an investigation on the most profitable energy generation mix and the potential of renewable energy sources as e.g. large scale solar thermal collector fields and thermal energy storage for a specific site numerous conditions including the electrical and thermal loads of consumers, existing and new technical equipment, climatic and economical boundary conditions etc. have to be evaluated. This document provides a questionnaire to collect the required information. The information should be given as complete and detailed as possible. The quality of an assessment is strongly depending on the quality of the provided information.

General description of supply area and consumers

General description

Please describe the supply area and the consumers. Please also list existing and intended installations. More detailed information is asked for below.

Site map

Please provide a site map and indicate the location of consumers and existing installations as well as possible locations for solar collectors and storage.

- What is the approximate amount of area available for placing solar collectors?
- How much is available on the ground and/or on roofs?
- Which is the state of the roof?
- What would be the cost of buying/renting land and/or roof?

Climatic data

Please fill in Table 2.4.1.

Table 2.4.1 Required climatic data.

Month	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Year
Ambient temperature (Mean value)													
Horizontal irradiation (Sum value)													
Heating degree days													
Room reference temperature:													
Ambient reference temperature:													
Cooling degree days (if required)													
Room reference temperature:													
Ambient reference temperature:													
Source of data:													

Note: If detailed (hourly) climatic data is available it should be attached as a separate data file.

Chronological development of the heat load

Please describe the chronological development of the supply area for the next years (e.g. changes in heat demand due to extension or refurbishment measures in the coming years etc.)

Electrical and thermal energy demand, distribution systems and temperature levels

Please fill in one Table 2.4.2 for each consumer / consumer group at the site.

Table 2.4.2 Consumer data template sheet.

Consumer or consumer group?	C/C G													
Consumer shortname	-													
No. of equal consumers	-	for groups of identical consumers, demand values will be multiplied by this number												
Type of usage	-	e.g. residential, office, industrial, etc.												
No. of users / inhabitants	-													
Gross floor area	m ²													
Heated floor area	m ²													
Cooled floor area	m ²													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Reference area
Monthly electricity demand	kWh/ m ² a													
Monthly heat demand for DHW*	kWh/ m ² a													
Monthly heat demand for space heating	kWh/ m ² a													
Total monthly heat demand (incl. e.g. process heat etc.)	kWh/ m ² a													
Total monthly cold demand	kWh/ m ² a													
Type of heat distribution system	-	e.g. radiator system, floor heating system, etc.												
Design values for heating supply / return temperature and dependency on ambient conditions	°C													
Type of DHW* prep. system	-	e.g. tank system, direct heating by heat exchanger, circulation system yes / no												
Design DHW* temperature	°C													
Thermal DHW circulation system	-	available? continuous or intermittent operation?												
Thermal DHW disinfection measures	-	e.g. regular temperature raises												

* DHW ~ domestic hot water.

Note: For the assessment short term (hourly) values of the demand are desirable. If short term demand values are available for consumer buildings e.g. from dynamic buildings simulations or from monitoring data they should be attached in an extra data file. If detailed values are not available they can be generated. Accuracy of results will be less in this case.

Technical equipment

Please list the relevant existing and / or foreseen technical equipment producing and storing thermal energy in Table 2.4.3. Please multiply the table for more than one supply system.

Table 2.4.3 Technical equipment producing and storing thermal energy.

	existing/ remaining/ intended	size	fuel	supply area
Boilers		kW		
Chillers		kW		
CHP-units		kW _{el} / kW _{th}		
Heat pumps		kW _{el} / kW _{th}		
Solar thermal collectors		m ² (absorber)		
Thermal storages		m ³		
Others				

	existing/ intended	length	supply area
Supply network for heat			
Supply networks for cold			

Geological data

Please provide available data about undisturbed groundwater level and natural groundwater flow.

Note: Usually the responsible water authorities have information about the general geological situation in a specific area.

Stratigraphic sequence

Please provide available information about the stratigraphic sequence down to a depth of 50 – 100 m below ground surface.

Economical data

- Natural gas purchase price in €/kWh (incl./excl. VAT)
- Electricity purchase price in €/kWh (incl./excl. VAT)
- Time dependency of the electricity price (e.g. on the hour of the day etc.)
- Capacity dependency of the electricity price (e.g. on contracted power, maximum electric load etc.)
- Financial limit for energy generating and storing installations
- Description of existing incentives for renewable / high efficiency generation units (e.g. cogeneration) (e.g. subsidies or tax reductions for purchasing the installation, feed-in tariff during operation, etc.)

Legal situation

Development scheme

Please include a summary of relevant boundary conditions from the development scheme.

Other legal boundary conditions / restrictions

Please give information about other legal boundary conditions / restrictions if appropriate.

ESCOs

Please provide contact details of existing ESCOs (Energy Service Company) in the area.

┆ The SDH fact sheets addresses both technical and non-technical issues, and provide state-of-the-art industry guidelines to which utilities can refer when considering/realizing SDH plants. For further information on Solar District Heating and the SDHtake-off project please visit www.solar-district-heating.eu. ┆